

Application No. 10/576,486
Paper Dated: January 8, 2009
In Reply to USPTO Correspondence of October 8, 2008
Attorney Docket No. 0388-061179

REMARKS

This Amendment is responsive to the October 8, 2008 Office Action. Claims 19-36 stand rejected. Claim 29 has been amended. Claims 30-36 have been cancelled. Support for the amendment to claim 29 may be found, for example, in the specification at page 4, lines 7-11 and page 25, lines 3-11. Claims 19-29 are now pending.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 19, 20, 24, 25 and 27 stand rejected under 35 U.S.C. § 103(a) for obviousness over United States Patent No. 5,691,811 to Kihira in view of United States Patent Application Publication No. 2002/0158198 to Kohama et al. Claims 21-23, 26 and 28 stand rejected under 35 U.S.C. § 103(a) for obviousness over Kihira and Kohama in view of United States Patent No. 5,963,328 to Yoshida et al. Claims 29-36 stand rejected under 35 U.S.C. § 103(a) for obviousness over Kihira in view of Yoshida. In view of the foregoing amendments and the following comments, reconsideration of the rejections is respectfully requested.

Independent claim 19 recites, *inter alia*, that “irradiation light irradiated from an irradiation face has a mesh-like pattern including meshes of a same shape, each mesh having an irradiation area smaller than a non-irradiation area in a plane normal to an optical axis; and the inspection target surface is inspected based on lightness/darkness information of an image area in the obtained image corresponding to a non-irradiated area in the inspection target surface.”

Independent claim 24 recites, *inter alia*, that “the irradiating means irradiates, from an irradiation face thereof, an irradiation light having a mesh-like pattern including meshes of a same shape, each mesh having an irradiation area smaller than a non-irradiation area in a plane normal to the optical axis; and the image processing means, in the image processing, processes lightness/darkness information of an image area corresponding to a non-irradiated area in the inspection target surface.”

Accordingly, the present invention, as defined by independent claims 19 and 24, relates to techniques based on the lightness/darkness information of the image areas. More particularly, irradiation light having a predetermined lightness/darkness pattern is emitted to an inspection target surface and an optical path of the irradiation light enters an area (non-irradiated area) which is bent by the presence of a defect and should be a dark portion if it were not for the defect. As discussed in the specification at page 5, lines 12-27, the present invention enables imaging of the inspection target surface with an imaging device to detect the defect by utilizing this phenomenon. In other words, the present invention depends on the assumption that the light is dispersed onto the dark portion. Further, with the present invention, as the light portion is formed like a mesh, the wraparound light introduced along the entire perimeter surrounding the dark portion can enter a pixel at a predetermined position of the imaging device having a two-dimensional extension. Consequently, as discussed in the specification of the present application at page 6, lines 5-11, the surface defect inspecting method and apparatus of claims 19 and 24 makes it possible to detect a defect having a shape, size, or depth which was difficult to be detected by the conventional technique.

In the Office Action at page 3, the Examiner concedes that Kihira fails to teach or suggest an irradiation light having a mesh-like pattern including meshes of a same shape with each mesh having an irradiation area smaller than a non-irradiation area in a plane normal to an optical axis, but relies upon the Kohama reference to teach such a feature. Although Kohama discloses that the irradiation region may have a mesh pattern (see paragraph [0128]), the device and method of Kohama forms the irradiated area as a mesh pattern in order to emit the charged particle beam intermittently to the sample, and thus the electric charge charged during the irradiation period is discharged during the non-irradiation period, whereby the inspection region can be prevented from being charged up (see paragraph [0125]). Thus, in Kohama, there is no direct connection between the mesh formation of the irradiated area and the defect detection. Further, if the inspecting method of Kihira is modified with the intermittent beam of Kohama such that the beam is dispersed onto the dark portion, the intermittent light emission to the inspection region will be insignificant to inspect the inspection target surface based on lightness/darkness information of an image area corresponding to a non-irradiated area in the inspection target surface as defined in

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independent claims 19 and 24. Accordingly, one of ordinary skill in the art would not combine the mesh pattern of Kohama with the inspecting method of Kihira as asserted in the Office Action at page 3.

Therefore, for at least the reasons discussed above, Kihira and Kohama, alone or in combination, fail to render claims 19 and 24 obvious.

As noted above, claims 29-36 stand rejected under 35 U.S.C. § 103(a) for obviousness over Kihira in view of Yoshida.

Independent claim 29 has been amended to recite, *inter alia*, that “the layout pattern comprises a mesh-like repetitive layout pattern which repeats a continuous arrangement of the light emitting elements along a predetermined direction thereby leaving a dark face of a predetermined shape therewithin; the imaging camera is disposed so as to receive, on at least one dark face, the irradiation light of each light emitting element reflected off an area opposed to the dark face of the inspection target surface; and an emitting area of each of the light emitting elements is smaller than an area of the dark face.” The Office Action at page 3 concedes that Kihira fails to teach or suggest an irradiation light having a mesh-like pattern including meshes of a same shape with each mesh having an irradiation area smaller than a non-irradiation area. Thus, Kihira and Yoshida fails to teach or suggest the surface inspecting apparatus as recited in amended independent claim 29. Furthermore, for the reasons discussed above with respect to independent claim 24, independent claim 29 is patentable over Kihira and Kohama.

Claims 30-36 have been cancelled by the foregoing amendment. Claims 20-23 and 25-28 depend from, and add further limitations to, either independent claim 19 or 24, and are believed to be patentable for the reasons discussed hereinabove in connection with independent claims 19 and 24.

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Conclusion

In view of the foregoing amendments and comments, Applicants respectfully request reconsideration of the rejections of claims 19-29 and allowance of the same.

Respectfully submitted,
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